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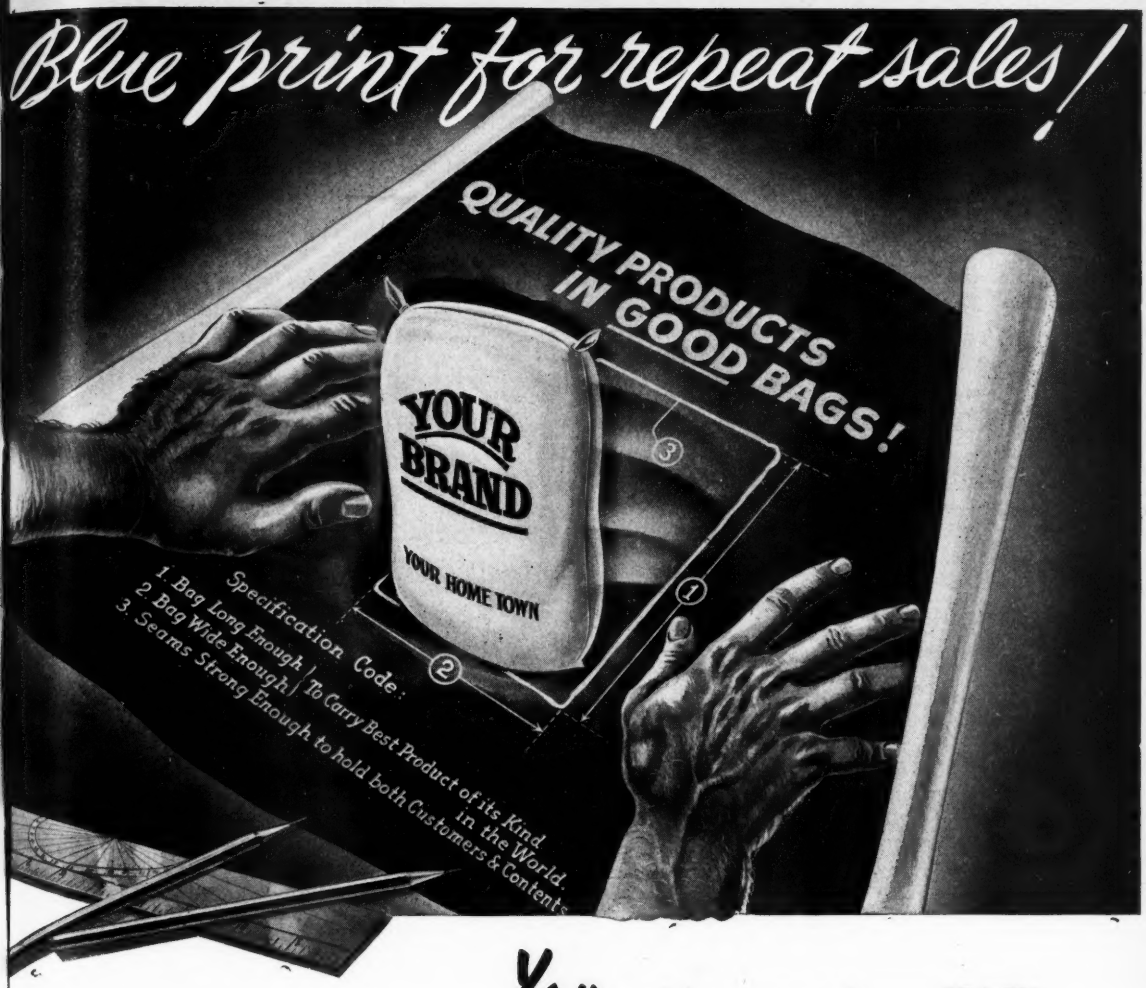

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See page 25

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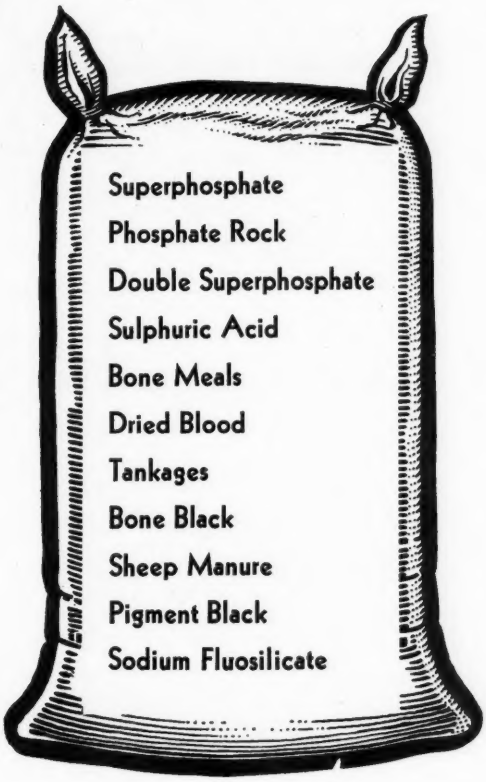

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...THE...

AMERICAN FERTILIZER

"That man is a benefactor to his race who makes two blades of grass to grow where but one grew before."

Vol. 103 NOVEMBER 17, 1945 No. 10

Fall Meeting of the National Fertilizer Association

Well Attended Meeting Hears Experts Discuss Problems Ahead of the Industry. Pasture Fertilization Emphasized. Dangers of Government Fertilizer Production Discussed.

The 21st fall meeting of the National Fertilizer Association was held at the Atlanta Biltmore Hotel, Atlanta, Ga., on November 12th, 13th, and 14th, after an interim during the war years when transportation and housing problems canceled all conventions. That the industry is alive to the post-war problems which lie ahead, is indicated by the registration which totaled well over 200.

The Board of Directors met on Monday, November 12th and spent both the morning and afternoon in discussing the program of Association activities for the coming season.

Tuesday General Session

The first general session of the Convention convened at 10 o'clock on Tuesday morning, November 13th, with M. H. Lockwood, Chairman of the Board of Directors presiding. After an invocation by Rev. Dr. Wallace M. Alston, pastor of the Druid Hills Presbyterian Church, Mr. Lockwood reviewed the wartime achievements of the fertilizer industry and called attention to some of the problems of the coming year.

"Despite all the recognized handicaps of war-time construction," said Mr. Lockwood, "the war record shows that large, small, medium, corporate, cooperative and new as well as old factors in the industry jumped into the breach and with the headaches which those directly involved know best, built, equipped and finally put in operation a number of new plants and plant additions. A recent tabulation of these, including some still planned, indicates that the industry responds promptly to such needs.

"Obviously, phosphates were among the important requirements in such areas. Even with a large portion of our high analysis phosphate production soundly assigned for export to our Allies under Lend-Lease, and acid supplies for phosphate processing limited by war demands, industry performed the miracle of exceeding all previous records during each of the war years.

"Just as many of us would have liked more beef, pork and bacon while the farmers of the nation were piling up new production records, so also did some fertilizer demand go unsatisfied while we attained new heights of production. Such is the basis for the uninformed or the prejudiced to clamor for a government crutch with which to 'save the fertility resources' of the nation. The chief justification of such forces seems to be that, because during the war, tax funds were tapped heavily to finance plants for *war* needs, the nation's taxpayers should be able to 'spare a few millions a year to save our national fertility' through government production of fertilizers.

"Such an uncourageous approach to an important problem would give many of us a laugh if we did not recognize the ugly implications it has in a complex civilization of which we are a part. Certainly private enterprise is imperfect, just as our modern democracies fall short of ideals. But the healthy effects of competitive enterprise outweigh the theoretical advantages of a paternalistic state."

The second speaker was J. W. Wizeman, Chief, Inorganics Branch, Chemicals Division,

Civilian Production Administration, who warned the industry that the world will not be free of fertilizer supply problems for some time to come, especially in Europe and Asia.

"Notwithstanding temporary shortages of certain materials, inadequate labor, unsatisfactory transportation conditions, bag shortages, and the like, the war-time record of fertilizer production in the United States is outstanding," said Mr. Wizeman. "While many farmers would have gladly purchased more fertilizers if materials had been available, a review of the over-all statistics for the war years shows a plant food production increase of 84 per cent during the war period.

"This fine record of domestic accomplishment does not mean that we live in a world free of fertilizer supply problems. Global supplies are short and the deficiencies will hamper rehabilitation of agriculture in the war-torn areas during the coming season and possibly 1947. It has been roughly estimated that the current world shortage of nitrogen exceeds 300,000 tons annually; of phosphates, 500,000 tons P_2O_5 and of potash, 175,000 tons K_2O equivalent.

"In the case of nitrogen, a deficiency exists of almost 20 per cent; of phosphates, 10 to 15 per cent, and of potash, under 10 per cent. These estimates exclude Asiatic requirements which are chiefly for nitrogenous materials. The magnitude of the Asiatic deficiencies can be appreciated if it is recalled that the pre-war Japanese Empire had a nitrogen capacity of approximately 400,000 tons, whereof a large share of the output was required for home consumption. The permanent cure for a shortage is to raise output. There is idle nitrogen capacity in Europe but nitrogen plants need coal and coal is the Number One priority problem in Europe. First consideration for the coming winter season will be to provide fuel for keeping the population from freezing. At the close of the winter period it will be too late to accumulate adequate nitrogen supplies for the 1946 crop year . . .

"Percentagewise, the world potash shortage is smaller than that of nitrogen and phosphates. Coal is required for production for mining and refining operations. The outlook for German exports is discouraging. The mines are located in the American, British and Russian zones of occupation, with the bulk of the potential output concentrated in the Russian zone. Fast action will be required by the respective governments in control of Germany if potash is to be made available in Europe in time to be of value for the 1946 growing season.

"Little immediate relief is in sight for meeting the world phosphate deficiency. As in the case of nitrogen, the coal supply problem is a limiting factor in the North African phosphate fields. While North Africa is behind schedule on exports, the trend of deliveries has improved in recent months. Deliveries of rock from Nauru and Oceania at about pre-war levels may be delayed 18 months to replace gear damaged by the Japanese early in the war."

Following Mr. Wizeman's address, Dr. Ralph W. Cummings, head of the North Carolina Department of Agronomy and Assistant Director of the Agricultural Experiment Station, Raleigh, N. C., reviewed the work that had been done in improving the production of corn in the South. Of special interest to his audience was the part that fertilizers are playing in this great work and the sales managers present received many helpful suggestions to pass on to their farmer customers during the coming season.

The meeting closed with two addresses by by C. T. Prindeville, Chairman of the Association's Public Relations Committee, and by Edwin F. Dakin, of Hill & Knowlton, the Association's public relations counsel. These outlined the steps that have been taken to place before the American public the facts of the fertilizer industry and the dangers facing the nation from the possible entrance of the Government into industrial production as indicated by the fertilizer production bills now being considered by Congress. Everyone connected directly or indirectly with the fertilizer industry is urged to aid in giving the maximum publicity to the information assembled by this vital department of the Association.

Annual Dinner

The Annual Industry Dinner was held at the hotel on Tuesday evening and was well attended. Chairman Lockwood presided and introduced a number of distinguished guests who were present on this occasion. There were no speeches, but the committee had arranged a program of entertainment which was enjoyed to the full by the assembled diners.

Wednesday General Session

The closing general session on Wednesday, November 14th, was devoted to some of the agronomic problems in the South. The first speaker was Hugh M. Comer, president and treasurer of Avondale Mills, Syla Conga, Alabama.

(Continued on page 24)

Ton of Hay for 200 Pounds of Fertilizer

The use of phosphate fertilizer on old redtop and timothy sod proved to be a good investment for Francis Bieser of St. Francois County, Mo. Last March, on 10 acres of a 36-acre field he applied 200 pounds of 20 per cent superphosphate with a grain drill. The yield was over 2½ tons of hay per acre. The remaining untreated 26 acres of the field produced only 1½ tons of hay per acre. Mr. Bieser feels that his investment of 200 pounds of fertilizer paid good dividends in the increased yield of one ton of hay per acre.

A Soil Physicist's Views on Productive Soils

A fertile soil is not always a productive soil. Appraisers, prospective farm buyers, and bankers attempt to judge soils and rate them according to their capacity to produce crops. For such an evaluation, it is essential to keep in mind the distinction between the terms "productive" and "fertile." According to J. B. Page of the Agronomy Department at the Ohio Agricultural Experiment Station, a fertile soil is well supplied with the chemical nutrients required for crop growth. A productive soil is not only well supplied with nutrients, but it also has favorable physical properties and is located in a favorable environment so that crops grow well.

Modern fertilizer practice is sufficiently well developed so that almost any soil can be made fertile. It is not as simple to change an unproductive soil to one that is productive. Under Ohio conditions, the factors which make a soil unproductive are usually poor drainage and poor structural condition. Drainage can, in part, be provided by tile lines, but a soil must have good structure to have adequate internal drainage. The best and only sure way we have of building and maintaining good soil structure is through the growth of sod crops and the return of liberal amounts of organic matter. A good structural condition in a soil keeps it loose and open so that it will drain well and be adequately "ventilated." Soils which do not have good structure will not produce adequate crops regardless of the amount of fertilizer applied.

Soils having poor structure are extremely difficult to handle and are usually either too wet or too dry to respond to normal tillage operations. The physical properties and productive capacities of such soils can be restored gradually by adopting rotations which keep the land under sod or green manure crop a large part of the time and where few tillage operations will be necessary. Under such programs amazing recoveries of favorable physical properties and productive capacity are frequently made. Farmers are advised to evaluate their soils in terms of productive capacity rather than fertility alone and to design their farm programs so that productive capacities may be increased.

Orchard Soil Fertility

The orchardman has a problem quite different from the ordinary farmer's when it comes to soil fertility. For one thing, the orchardman keeps a crop on one field for fifteen, fifty, seventy-five or even more years, so he cannot rely on crop rotation to keep the soil in condition. And during all those years, the nutrients from the fruit itself isn't returned to the soil like it is in general farming where grain and hay are returned to the field in the form of manure and crop refuse.

However, specialists at Michigan State College contend that more organic matter could be produced right in the orchard if there is a properly fertilized cover crop. They refer to fertilizer with a high phosphorus and potash content in addition to the regular spring application of nitrogen.

In the case of sod orchards, fertilizer—either 200 pounds of 0–20–20 or 350 pounds of 0–12–12—could be applied at almost any time of the year. Now is as good a time as any since other work does not crowd too much at this time of the year.

Keeping up the supply of organic matter is a big problem in most vineyards, too—so the same treatment is suggested for them. Two hundred pounds of 0–20–20 or 350 pounds of 0–12–12 should help the soil along nicely. This fertilizer program helps the cover crops; that means more green manure to put back in the soil next spring. Then if the vine does need more mineral, it will be in the soil waiting for the roots to take it.

In some orchards cover crops cannot make enough growth to protect the soil and maintain the supply of organic matter in spite of fertilization. In this case, a test of the soil will probably indicate a deficiency of lime. This calls for applications of liming materials, such as limestone, marl or refuse lime. However, the specialists emphasize the testing of the soil. An excess of liming material is as harmful—if not more so—than a lime deficiency.—*Michigan Information Service.*

Fertilizers In Wartime

By C. G. GRAN

From 1914 to 1920 the average price paid by farmers for fertilizer rose 86 per cent. The rise from 1939 to the spring of 1943 when the "hold the line" order went into effect was only 21 per cent and *no rise occurred since 1943 nor is any rise anticipated.* Prices alone, however, fail to tell the complete story of values between fertilizer used now and 25 years ago. A ton of fertilizer *contains about 50 per cent more plant food now than it did in 1920.*

During World War I there was a marked decline in plant food content, as low grade materials then available in this country were substituted for materials previously imported from abroad. The plant food ratio continued to rise steadily during this war until the last year or two.

Production and, consequently, consumption declined during the first World War—from 7, 100,000 tons in 1914 to 5,125,000 tons in 1916—a loss of approximately 28 per cent. This was largely due to the stoppage of imported materials, particularly potash, for supplies of which we relied almost entirely upon shipments from Germany. Not until 1920 was production able to attain the 1914 figure.

During World War II production and consumption have risen from 7,532,000 tons in 1939 to 12,072,000 tons in 1944—a gain of approximately 69 per cent in tonnage containing 50 per cent more plant food per ton than fertilizer contained 25 years ago.

The American fertilizer industry produced a substantially greater quantity of fertilizer in 1944 than was used by the farmers of this country. The difference was exported, supplementing our food exports, to help feed our allies.

Fortunately for the people in this country, and also for our British and Russian allies, the American fertilizer industry became independent of Europe as a source of fertilizer materials in the period between the two wars.

Outlook: Demand-Supply

Indications point toward a continued demand at a relatively high level for fertilizers during a period of at least two years following the close of hostilities.

It may reasonably be predicted that the demand will coincide closely with farmer's cash income, as usual, and that such income will be substantially influenced by government price support for crops. Even though measures limiting acreage should be adopted, farmers may use more fertilizer to get increased production from a limited number of acres.

Continuation of the soil improvement program involving governmental financial assistance as a conservation payment will also be a powerful factor in maintaining a large market for fertilizer materials.

Many farmers will seek to curtail unit costs by growing a greater volume of crops on fewer acres through heavy applications of fertilizer.

Export demand, too, will probably remain heavy for a year or two—until foreign producers of fertilizer can re-establish production and distribution facilities.

Barring unforeseen circumstances, domestic supplies of fertilizer should be adequate to care for all domestic demands fully, and most if not all of the demands for export.

We now have a domestic capacity for production of nitrogen materials far in excess of normal requirements and now that sulphuric acid is not required in great quantities for the manufacture of explosives, aviation gasoline and armor plate, supplies should be plentiful for the manufacture of superphosphate. These factors, together with "tight" transportation and an inadequate labor supply, have been our major "bottlenecks" during the war as inhibitors of attaining even greater production.

Potash supplies will be sufficient to meet all domestic requirements that can be anticipated, but it is expected that there will be little, if any, for export.

Help Needed

Agricultural leaders might avail themselves of any opportunity to inform their following that:

1. If wartime elimination of low analysis grades of mixed fertilizer results in only higher analysis grades being available for purchase, the price per unit of plant food is generally lower, even though the cost per ton may be increased. Some farmers seem to think that if they must pay more now for a ton of 5–10–5 fertilizer (containing 20 units) than they used to pay for a 4–8–4 mixture (containing 16 units), the price has

increased. This is an erroneous impression.

2. Some farmers should pay more attention to customary discounts due them for terms of delivery, quantities purchased and terms of payment. A few dealers and agents, not many, seem to have ignored customary discounts in some cases, in order to gain the effect of an increased price and thereby fatten their allegedly alim margin of compensation.

3. Relatively speaking, in terms of prices farmers receive for their products and prices they pay for items of production expense, in contrast with their price status before the war, fertilizer is the best "bargain" on the market today.

November Cotton Report

A 1945 cotton crop for the United States of 9,368,000 bales of 500 pounds gross weight is forecast by the Crop Reporting Board, based upon information as of November 1. The decrease of 411,000 bales from October 1 brings the indicated production to the lowest in any year since 1899, with the exception of 1921; it compares with 12,230,000 bales produced in 1944, and the 10-year (1934–43) average of 12,293,000 bales. Lint yield per acre for the United States, at 249.7 pounds, is 15 per cent less than the last year's record yield of 293.5 pounds, but 8 per cent above the 10-year average.

No estimate of cottonseed production will be made until December. However, if the ratio of lint to cottonseed should be the same as the average for the past 5 years, production of cottonseed would be 3,858,000 tons.

The Bureau of the Census reports that 5,153,639 bales of cotton were ginned from the crop of 1945 prior to November 1, compared with 8,282,768 bales for 1944, and 9,062,869 bales for 1943.

PRODUCTION (Ginnings)[1]
500 POUND GROSS WEIGHT BALES

	Average 1934–1943	1944	1945 crop indicated Nov. 1
	Thous. bales	Thous. bales	Thous. bales
Missouri	348	411	200
Virginia	28	29	22
N. Carolina	604	710	440
S. Carolina	755	864	640
Georgia	972	810	650
Florida	24	13	8
Tennessee	498	562	495
Alabama	1,010	1,006	935
Mississippi	1,677	1,937	1,620
Arkansas	1,322	1,394	1,150
Louisiana	643	620	395
Oklahoma	565	634	295
Texas	3,112	2,646	1,880
New Mexico	109	116	119
Arizona	185	136	127
California	424	327	380
All other	18	15	12
United States	12,293	12,230	9,368
Amer. Egypt[2]	34.2	8.8	4.3

[1] Allowances made for interstate movement of seed cotton for ginning. A 500 lb. gross weight bale represents approximately 480 lb. net lint.

[2] Included in State and United States totals. Grown principally in Arizona, New Mexico, and Texas.

Farmers Building 3-Story Corn Crops

"The farmer in North Carolina, who grows a crop of corn with his regular variety and a small amount of fertilizer, is building only a one-story house, where he can build a three-story house with improved practices," says Dr. Emerson Collins, in charge of extension agronomy at State College.

"Everyone will agree that this has been an excellent corn year in most sections," Dr. Collins declares, "but the good seasons have shown us just how far we can go in producing corn and what the expense will be under the best of conditions. We can't expect gains like this every year but just the same we are convinced we can't afford to produce an average of 20 to 22 bushels of corn per acre."

He points to the record of a Halifax County farmer as an excellent example of what he means by building a three-story corn crop. The farmer produced 41 bushels per acre with his regular variety of corn and his usual fertilizer during an exceptionally good season.

When the fertilizer was stepped up to 500 pounds of high grade fertilizer per acre at planting and 400 pounds of quick acting nitrogen material as a top-dresser, the yield was 79 bushels per acre. This was a two-story house.

When the house was increased to three stories by the addition of a well-adapted strain of hybrid seed, the yield was 104.8 bushels per acre.

The corn in the second story, produced through extra fertilization cost about 30 cents a bushel. The corn in the third story was approximately 26 bushels and it was grown at a cost of $1.00 for the hybrid seed, or slightly less than 4 cents a bushel. "It surely pays to grow three-story corn," Collins says.

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Principal Articles in This Issue

Soil Conservation and Fertilizers

Greatest returns from the use of fertilizers come from good soils. Good soils have been created by long natural processes of breaking down the minerals of rocks, the accumulation of decayed organic matter and by protection from erosion. Only the top few inches of soil, thus prepared by nature, have the physical properties suitable for the efficient growth of plants. Once the top soil is washed away and the raw subsoil is the medium of plant roots, conditions do not admit of the efficient use of plant food no matter how much is applied.

One reason is that when the top soil was removed, the organic content or humus of the soil was removed. With this loss the soil's water-holding capacity was reduced. If the roots of plants cannot find free water in the soil, they cannot absorb the dissolved plant food and carry it up into the plant for growth and seed production.

This same organic matter serves as a sponge to absorb rainfall so that less runs off the surface, therefore less soil is carried away. Organic matter also provides food for soil organisms which, in turn, effect chemical changes that help release the natural plant foods of the soils.

The chief losses through soil erosion occur where the cultivated crops are grown. Bare soils have no protection against the pelting raindrops and surface wash. Close growing crops that cover the ground and hold soils in place with their network of roots suffer least from erosion. But since we cannot get along without cultivated crops, means have been devised for checking the flow of surface water, permitting it to flow gently off of the sloping fields into diversion channels, thus holding the soil in place as much as possible.

The problem of soil erosion has been faced, though, it is admitted, not before the tragedy of heavy losses has been experienced. Throughout the country soil conservationists will be found planning with farmers ways of reducing soil erosion, planning a cropping system that will guard the soil, laying out contours by which plowed furrows will check and hold the water of rainfall rather than for making them a medium for accumulating erosion, and mapping a system of terraces and diversion ditches to retard surface flow of water and guide it gently into diversion ditches.

No work undertaken for the benefit of agriculture is of greater importance than that

of soil conservation. It is working at the very foundation of agriculture where work must be done to provide an enduring agriculture. While doing this they plan the most profitable use of the land.

No discussion of soil conservation would be complete without praise of H. H. Bennett, the apostle of soil conservation who cried aloud in the wilderness for a long time before he, above all others, gained recognition and government aid for the great work he is now heading in the United States Department of Agriculture to repair the foundations of agriculture. Raised on a North Carolina farm and witnessing the tragedy of soil erosion, he did something about it.

Phosphate Export Association Dissolved

After more than 25 years' existence, the Phosphate Export Association, with offices at 393 Seventh Ave., New York, has been dissolved. Fred C. Noyes, former executive secretary, has been appointed liquidator. The Association, which handled export sales for the leading phosphate rock producers, was composed of American Agricultural Chemical Company, American Cyanamid & Chemical Company, Coronet Phosphate Company, International Mineral & Chemical Corporation, Phosphate Mining Company, Southern Phosphate Corporation, and Swift & Co. Hereafter, these concerns will conduct their own individual export business in phosphate rock.

Noble Elected President of Pacific Guano Company

At a recent meeting of the Board of Directors of Pacific Guano Company, Berkeley, California, Willer Noble was elected president of the company, succeeding J. T. Phillips who was elected Chairman of the Board. Mr. Noble has many friends throughout the industry, as he has taken an active part in industry affairs and has been a regular attendant at the meetings of the National Fertilizer Association as a member of the Board of Directors.

French Potash Production

During the period ending June 30, 1946, the French potash mines expect to produce 440,000 tons K_2O of which 157,000 tons are reserved for export to European countries. In accordance with the plan of the Combined Raw Materials Board in Washington, the balance will go to France and her colonies.

During the last six months of 1946, the French mines expect to produce 700,000 tons K_2O enabling them to resume exports to all parts of the world.

The sulphate of potash plants in France and Belgium have started producing but are severely handicapped at present by the lack of coal.

The chief problems that face the French potash producers are lack of coal and transportation, the Rhine not having been cleared to Antwerp.

Grady Appointed Advertising and Sales Manager of Chase Bag Co.

Jack P. Grady has been appointed Advertising and Sales Promotion Manager for the Chase Bag Company, according to an announcement by R. N. Conners, General Sales Manager.

Mr. Grady has just been released from the U. S. Naval Reserve in which he held the rank of Lieutenant. During his four and a half years in uniform, he served on a submarine chaser in Alaska and on the battleship *California* in the Pacific.

JACK P. GRADY

He assumes his new duties at Chase's general sales offices, 309 West Jackson Boulevard in Chicago. Prior to entering the service in 1941, Mr. Grady spent several years in Chase's sales promotion department.

Fertilizer Exports and Imports During The War Years

A MARKED decline occurred in foreign trade in fertilizer materials during the war period. Exports fell off more sharply than did imports; export tonnage declined one-half from the 1936–1938 level, compared with a drop of one-third in imports. There was an increase in the tonnage of materials imported in each of the years 1942, 1943 and 1944, while exports declined in each of those years.

EXPORTS

Export volume in the last two years fell to the lowest level reached since World War I. Since exports of phosphate rock, with a relatively low value per ton, have fallen off more than other materials, the total value of exports has not gone down as much as has volume.

Lend-lease exports accounted for an important part of the total fertilizer exports in 1941–1944. A substantial proportion of lend-lease exports consisted of concentrated superphosphate shipped to the United Kingdom. Smaller quantities of other materials have been sent under lend-lease to various parts of the world, helping to introduce United States fertilizers to these countries. This should help to stimulate future export trade.

Commercial fertilizer exports, on a dollar value basis, fell off somewhat more during the war than did our total commercial exports; the ratio of fertilizer exports to total exports dropped by nearly two-thirds from 1936 to 1942.

An important shift has taken place in the types of materials exported. Phosphate rock accounted for 77 per cent of total fertilizer exports in 1930–1934. By 1940–1944 the ratio was down to 60 per cent, and in 1943 it was only 45 per cent. Our 1943 phosphate rock production was the largest on record, but exports were the smallest in many years. We exported 6.7 per cent of our production that year, compared with 35 per cent in 1931–1935. Two of our most important prewar phosphate rock customers, Germany and Japan, were completely shut off by the war. The decline in phosphate rock exports was partially offset by increases in exports of other materials, especially potash and superosphate.

Our 1939 fertilizer exports were valued at $17,141,000. Of that total, exports amounting to $10,757,000, or 63 per cent, went to countries later cut off by the war. Exports of $15,305,000 in 1944 compare with exports of $6,384,000 to the same countries in 1939. The largest increases have been in exports to Canada and the United Kingdom. It is doubtful if fertilizer will be shipped to these countries in the future at the same rate as during the war. Shipments to the United Kingdom were under lend-lease, which is now ended; the British have already announced plans for expanding their fertilizer industry. Latin America and the Orient are likely to prove the expanding markets in the future. UNRRA is currently distributing limited quantities of United States fertilizer in Europe and is planning shipments to China. This should aid in developing an export market.

IMPORTS

Imports of fertilizer materials have remained at a relatively high level, in spite of our greatly expanded domestic production. Import tonnage in 1944 was only 13 per cent below 1939, while the value of 1944 imports was the largest for any year since 1931 with the exception of 1937.

As a result of the development of a domestic potash industry and of the expansion of nitrogen production facilities, the United States has achieved a considerable degree of national self-sufficiency in regard to fertilizer. In 1925–1929, our imports were equivalent to one-third of our total fertilizer consumption; in the last three years the proportion averaged only 12 per cent.

Principle changes in the types of materials imported have been the practical disappearance of potash imports and an increase in sodium nitrate imports.

1945 EXPORTS AND IMPORTS

Exports in the first seven months of this year were 95,000 tons under the corresponding period of 1944. Nitrogenous materials were exported in larger volume this year, but declines took place in other materials.

Imports this year have been above the level of the years immediately preceding the outbreak of the war, in spite of the practical elimination of potash imports.

UNITED STATES EXPORTS AND IMPORTS OF FERTILIZERS AND FERTILIZER MATERIALS

By Calendar Years, in Short Tons

Exports	1940	1941*	1942*	1943*	1944*
Ammonium sulphate	168,955	94,770	27,490	78 005	10,615
Sodium nitrate	†	†	45,711	6,740	11,435
Other nitrogenous chemicals	112,020	67,256	4,378	8,961	11,690
Nitrogenous organic waste	7,543	6,257	5,913	5,586	5,916
Total Nitrogenous Materials	288,518	168,283	83,492	99,292	39,656
High grade hard rock	171,483	†	91,326	47,952	26,187
Land pebble rock	675,231	†	326,060	237,928	260,281
Other rock	†	†	174,780	115,322	205,509
Total Phosphate Rock	846,714	1,165,534	592,166	401,202	491,977
Superphosphate	158,244	164,500	184,903	268,552	205,922
Other phosphate materials	13,355	2,568	5,883	734	611
Total Phosphate Materials	1,018,313	1,332,602	782,952	670,488	698,510
Muriate of potash	†	†	36,456	81,613	86,933
Other potash	†	†	47,946	29,929	23,124
Total Potash Materials	93,060	91,950	84,402	111,542	110,057
Concentrated chem. fertilizers	28,637	9,360	5,314	3,369	1,259
Prepared fertilizer mixtures	8,144	23,440	7,370	3,606	27,406
Grand Total	1,436,672	1,625,635	963,530	888,297	876,888
Imports					
Ammonium sulphate	47,302	35,119	53,340	99,827	103,628
Ammonium nitrate mixtures	17,470	0	0	2,895	317
Calcium cyanamide	132,566	143,878	90,000	125,634	101,886
Calcium nitrate	1,542	0	0	0	5
Guano	879	17,241	3,503	9,622	4,889
Dried blood	13,031	18,779	4,105	5,071	17,664
Sodium nitrate	744,151	610,569	899,150	761,165	712,434
Ammonium phosphates	50,156	62,082	28,583	43,987	91,943
Tankage	14,044	15,361	2,536	16,611	12,536
Castor bean pomace	7,053	36	41	89	60
Fish scrap and meal	7,728	1,483	424	264	869
Other nitrogenous materials	48,214	63,446	13,529	63,873	114,711
Total Nitrogenous Materials	1,084,136	967,994	1,095,211	1,129,038	1,160,942
Bone phosphates	75,226	117,947	54,995	44,078	67,358
Normal superphosphate	8,166	13,459	6,681	282	1,357
Concentrated superphosphate	3,207	5,973	11,977	2,511	6
Ammoniated superphosphate	108	20	0	67	0
All other phosphates	6,850	4,861	4,217	52,089	138,224
Total Phosphate Materials	93,557	142,260	77,870	99,027	206,945
Muriate of potash	152,493	14,671	1,564	25,212	4,332
Potash-sodium nit. mixtures	55,016	34,541	14,272	19,767	9,407
Other potash materials	66,964	125	59	30	0
Total Potash Materials	274,473	49,337	15,895	45,009	13,739
Other fertilizers	42,633	54,658	52,246	72,378	67,813
Grand Total	1,494,799	1,214,249	1,241,222	1,345,452	1,449,439

*Export statistics include lend-lease exports.

†Not reported separately.

October Tag Sales Show Sharp Increase

Fertilizer tax tag sales in October were at unusually high level, according to reports by State control officials to The National Fertilizer Association. Total sales in the 17 reporting States were 439,000 tons, the largest October sales ever reported. They were 60 per cent larger than sales in October, 1944, and 22 per cent larger than in October, 1943. Sales were also considerably larger in October than in September, which was somewhat contrary to the usual seasonal trend.

Increases over October, 1944, were reported by 10 of the 12 Southern States, and the decline in Alabama was negligible. The increase over last year in the entire region was 55 per cent.

October sales in the Midwest were more than twice as large as a year ago, with 3 of the 5 States reporting increases.

(Continued on page 20)

FERTILIZER TAX TAG SALES*

COMPILED BY THE NATIONAL FERTILIZER ASSOCIATION

STATE	OCTOBER				JANUARY-OCTOBER		
	1945 Tons	1944 Tons	1943 Tons	% of 1944	1945 Tons	1944 Tons	1943 Tons
Virginia	32,466	31,498	34,466	118	531,716	449,646	434,731
North Carolina	60,906	30,585	61,304	113	1,268,756	1,120,304	1,194,865
South Carolina	33,280	22,670	42,440	110	725,260	657,793	758,223
Georgia	59,854	36,794	42,234	108	989,702	920,463	936,737
Florida	125,542	60,821	81,890	112	716,470	642,530	558,930
Alabama	16,400	16,500	12,100	113	665,500	588,350	643,800
Mississippi	4,500	15,750	35,670	99	337,557	338,564	423,214
Tennessee	19,975	17,852	13,913	108	267,202	247,371	219,266
Arkansas	3,200	2,500	4,430	103	113,400	110,583	165,705
Louisiana	6,024	2,375	4,680	105	213,510	203,295	183,368
Texas	16,940	8,365	8,200	112	191,855	170,714	155,150
Oklahoma	2,950	500	500	129	22,312	17,351	18,088
Total South	382,037	246,210	341,827	111	6,043,240	5,466,964	5,692,077
Indiana	26,566	5,896	3,800	120	408,606	339,443	383,790
Illinois	11,750	13,200	4,087	143	218,514	153,090	88,180
Kentucky	14,905	6,710	7,500	114	262,146	229,709	154,707
Missouri	1,388	2,399	1,515	109	146,634	135,001	89,561
Kansas	2,310	200	75	97	36,615	37,696	16,279
Total Midwest	56,919	28,405	16,977	120	1,072,515	894,939	732,517
Grand Total	438,956	274,615	358,804	112	7,115,755	6,361,903	6,424,594

* State fertilizer control officials in the 17 reporting States compile monthly statistics on the sale of fertilizer tax tags and report these statistics to The National Fertilizer Association. The figures indicate the equivalent number of short tons of fertilizer represented by the tax tags sold to fertilizer producers and which are required by law to be attached to each bag of fertilizer sold in the various States. The equivalent tonnage represented by the sale of tax tags may be somewhat larger or smaller than actual sales of fertilizer, due to the lag between the purchase of tags and the delivery of fertilizer on which those tags are used.

FERTILIZER MATERIALS MARKET

NEW YORK

Fertilizer Material Situation Still Tight. Sulphate of Ammonia Production Drops. Superphosphate and Potash Supplies Limited to Filling Contract Shipments with No Surplus Available for Current Orders.

Exclusive Correspondence to "The American Fertilizer"

NEW YORK, November 14, 1945.

Sulphate of Ammonia

In spite of the figures for September production of sulphate of ammonia, the situation is becoming steadily tighter. Present reports are that output is at the lowest level so far this year and shipments on contracts are falling behind schedule. Some mixers are in the market for additional supplies but the prospects that these orders can be filled do not look very promising.

Nitrate of Soda

There has been no change in this situation. Supplies at the ports are deemed adequate to fill current orders. Buyers are not disposed to accumulate reserve supplies in advance of the season as was done during the war years.

Organic Materials

There is still no improvement in the supply of organics. Sales of occasion carload lots are reported but these are principally to feed manufacturers. There is little prospect of increased supplies for fertilizer use during the coming season.

Phosphate Rock

Advance sales of phosphate rock for the coming season have been heavy and are taking most of current production. Export business has been increasing and has made a considerable dent in stock piles. It is expected that even greater quantities will find their way into the export market.

Superphosphate

While the situation has improved somewhat from the extremely tight position of a year ago, there is still room for considerable improvement. Labor shortage is still noticeable in some of the important producing areas, and acidulators are not disposed to accept additional orders. Demand for concentrated superphosphate is still well ahead of present and prospective supply.

Potash

The potash situation remains tight. Current production continues at the highest levels permitted by the manpower situation. Many orders for extra supplies will go unfilled as present production will handle only the contract shipments booked last summer. There is no resale material on the market at present.

CHICAGO

Fertilizer Organics Still Scarce. Offerings Scarce. Feed Market Tight.

Exclusive Correspondence to "The American Fertilizer"

CHICAGO, November 12, 1945.

The Western organic market remains dull as the result of scarcity of offerings. Inquiry for steamed and raw bone meal is fairly active but, like other material, offerings are lacking.

Production of animal protein is insufficient to meet the demand at full ceiling prices.

Ceiling prices are:

High grade ground fertilizer tankage, $3.85 to $4.00 ($4.68 to $4.86 per unit N) and 10 cents; standard grades crushed feeding tankage, $5.53 per unit ammonia ($6.72 per unit N); blood, $5.53 ($6.72 per unit N); dry rendered tankage, $1.25 per unit of protein, f. o. b. producing points.

CHARLESTON

Organics Still Extremely Scarce. Sulphate of Ammonia Production Drops. Phosphate Rock Supplies Low.

Exclusive Correspondence to "The American Fertilizer"

CHARLESTON, November 12, 1945.

Organics.—No change in this situation. All organics continue extremely scarce and the condition has not been improved by the fact that there is also a scarcity of cottonseed meal.

Sulphate of Ammonia.—The recent coal

strike has affected the production of this material. The market is not only very tight but there is every indication that the season's production will not be up to expectation.

Dried Blood.—Only occasional lots are being offered at $5.53 per unit of ammonia ($6.72 per unit N.), f. o. b. Chicago, and this is all going into the feed market.

Nitrate of Soda.—The October price on domestic nitrate of soda has been extended through November.

Phosphate Rock.—The situation on this has become quite critical as the producers, due to labor conditions, are having great difficulty keeping up with their contract requirements.

PHILADELPHIA

Active Demand and Very Short Supply in Many Fertilizer Materials. Feed Market Taking Most Organics.

Exclusive Correspondence to "The American Fertilizer"

PHILADELPHIA, November 12, 1945.

It's the same story—demand for all materials continues brisk. Organics are still out of sight and some of the inorganic materials, such as sulphate of ammonia and potash salts, are now scarce and in demand.

Organic Ammoniates.—Keen demand from both fertilizer and feed trade, with the latter usually getting the break if an odd lot should appear.

Sulphate of Ammonia.—The strike situation has caused a shortage of this material and many mixers are looking for resale lots.

Nitrate of Soda.—The situation is just about normal for the season.

Superphosphate.—Shipments against contracts continue at good rate and production manages to keep pace, but new accounts are not solicited.

Bone Meal.—In same position as all the animal by-products—not sufficient to meet the demand.

Potashes.—Many inquiries for all types of potash materials.

Castor Pomace.—Another scarce material with many in the market hungry for supplies.

Fertilized Grasses and Clovers Bring Large Beef Yields

Gainesville, Fla. — "Farmers throughout Florida are planning to establish new clover pastures this fall and to refertilize already established clover pastures," says W. E. Stokes, head of the agronomy department at the University of Florida Agricultural Experiment Station.

"Farmers know that fertilized grasses produce more beef per acre than unfertilized grasses," he says, "and they are beginning to realize that combinations of grasses and legumes—clover in winter and lespedeza in summer—well fertilized produce much higher cattle gains." In support of this, he cites grazing results obtained last year at the Experiment Station in Gainesville.

Unfertilized carpet grass averaged 72 pounds of beef per acre during the season, fertilized carpet 141 pounds, carpet and lespedeza 250 pounds and clover and carpet 752 pounds of beef during the grazing season. The legumes produce feed and add nitrogen to the soil to improve grass growth and can be grazed with equal advantage by dairy cattle.

For establishing clover—which grows best on moist soils — the Experiment Station recommends from 1,000 to 3,000 pounds of ground or dolomitic limestone and either 500 pounds of superphosphate and 100 pounds of muriate or sulphate of potash or 600 pounds of 0–14–10 commercial fertilizer per acre. For maintaining clover stands applications of 300 to 500 pounds of 0–14–10 fertilizer annually and one ton of lime every three to five years are suggested.

OCTOBER TAG SALES SHOW SHARP INCREASE

(Continued from page 16)

Total sales in the first ten months of this year were 7,116,000 tons. This represents an increase of 754,000 tons, or 12 per cent, over the corresponding period of last year. The increase has been widespread, with larger sales this year than last in all of the States except Mississippi and Kansas and the declines in these two States were very small. The largest increases, percentagewise, have been in Illinois, Oklahoma and Indiana. Sales in Illinois have been two and a half times as large as they were two years ago.

There has been a greater relative increase in sales during the fall season than there was during the spring season. Combined sales in the January-June period in the 17 States exceeded sales in the first six months of 1944 by 436,000 tons, or 8 per cent. July-October sales increased over last year by 318,000 tons, or 30 per cent.

Tag sales have risen to a new all-time high point this year. Declines in tag sales in the first 10 months have occurred in only 2 of the last 10 years, in 1938 and 1944. The trend has been much more sharply upward in the Midwest than in the South. Increases in January-October sales from 1935 to 1945 were 61 per cent in the South, 199 per cent in the Midwest, and 73 per cent in the 17 States combined.

It appears that this will be the fifth consecutive year in which fertilizer consumption in the country as a whole has risen to a new peak. Present indications point to another record in 1946 unless labor or transportation troubles or lack of raw materials prohibits.

Top-dress the Victory with Victory Bonds

Wheat Responds to Fertilizer in Idaho

K. H. Klages, University of Idaho agronomist, has stated that ammonium sulphate fertilizer on plot experiments of winter wheat at the university have shown yield increases of from five to nine bushels to the acre on several plots of ground. Heaviest increases came on acreages where stubble of the previous year's crop had been turned under before application of the fertilizer was made.

"Ammonium sulphate enables the soil—through increased nitrogen supplies—to make use of the old straw," Klages explained. "Without it the fertilizing qualities of the rotted stubble cannot be used by the new plant, and the yield is actually lower than where stubble is destroyed the fall before."

Klages did not hesitate, however, in condemning the practice of burning stubble over the fields. As a long-time practice he declared the fertility that goes up in smoke over thousands of acres of Palouse wheat fields annually will deplete the fields of valuable materials and will have to be replaced at considerable cost if the fields are to continue to produce.

"Amonium sulphate costs four cents a pound," the agronomist figured. "There should be 150 pounds to the acre applied in regions where we have abundant rainfall. In the very dry areas, the amount can be cut to a minimum of 50 pounds to the acre. At that rate any farmer will more than get his money back with the first year's crop, and that is not the end of the fertilizer. It goes on paying for several seasons."

Klages reminded farmer and wheat-grower of the state that the best protection against erosion is the ability of the soil to produce enough plant material to prevent washing in steep areas. This alone would pay the cost of the fertilizer over a period of years.

Phosphate Rock in First Half in 1945

Total mine production of phosphate rock in the first half of 1945, according to reports of producers to the Bureau of Mines, United States Department of the Interior, was 2,773,894 long tons. Phosphate rock sold or used in the first half of 1945, 2,629,669 tons, was slightly less than the corresponding period of 1944; the value, $10,567,755, was about $385,000 greater. The average value of the phosphate rock sold or used increased from $3.80 in the first half of 1944 to $4.02 in the similar period of 1945, increases being shown in nearly all classes of rock. Total stocks in producers' hands increased.

In the first half of 1944, phosphate rock was mined in Florida, Tennessee, Idaho, and Montana, and apatite in Virginia. Florida was the leading shipper as usual, its marketed production being nearly three times that of its nearest competitor, Tennessee. Shipments of Florida soft rock increased, but those of land pebble and hard rock declined, the latter greatly. The average values of land pebble and hard rock increased, but that of soft rock declined. The total value of shipments of land pebble in the first six months of 1945 was greater than in the similar period of 1944, but those of soft rock and hard rock were less. The quantity of Tennessee rock sold or used in the first half of 1945 was considerably greater than in the corresponding period of 1944, and there was a considerable increase in the total value. Idaho showed an increase in the quantity of phosphate rock sold or used in the first six months of 1945 over the January-to-June period of 1944. Both average and total values also increased. Montana shipments in the first six months of 1945 were much less than those of the corresponding period of 1944, with decreases in total and average values.

SALIENT STATISTICS OF THE PHOSPHATE-ROCK INDUSTRY IN THE UNITED STATES, JANUARY–JUNE, 1944 AND 1945

	1944				1945			
	Long Tons		Value at Mines		Long Tons		Value at Mines	
	Phosphate Rock	P_2O_5 Content	Total	Average	Phosphate Rock	P_2O_5 Content	Total	Average
Production (mined)	2,581,561	861,429	[1]	[1]	2,773,894	889,268	[1]	[1]
Sold or used by producers:								
Florida:								
Land pebble	1,876,080	630,948	$ 6,434,749	$3.43	1,789,796	600,611	$ 6,652,343	$3.72
Soft rock	34,705	7,317	157,368	4.53	36,374	7,702	151,494	4.18
Hard rock	12,830	4,632	82,718	6.45	3,500	1,256	23,862	6.82
Total, Florida	1,923,615	642,897	6,674,835	3.47	1,829,570	609,569	6,827,699	3.73
Tennessee[2,3]	620,584	166,139	2,872,425	4.63	682,670	197,125	3,183,588	4.66
Idaho	58,163	18,629	302,969	5.21	62,220	19,593	348,060	5.59
Montana	80,239	25,610	333,129	4.15	55,209	17,549	208,408	3.77
Virginia	[2]	[2]	[2]	[2]	[2]	[2]	[2]	[2]
Total, United States	2,682,601	853,275	$10,183,358	$3.80	2,629,669	843,836	$10,567,755	$4.02
Stocks in producers' hands, June 30:								
Florida	881,000	293,000	[1]	[1]	843,000	278,000	[1]	[1]
Tennessee[2,3,4]	405,000	103,000	[1]	[1]	585,000	146,000	[1]	[1]
Other	5,000	2,000	[1]	[1]	8,000	2,000	[1]	[1]
Total stocks[4]	1,291,000	398,000	[1]	[1]	1,436,000	426,000	[1]	[1]

[1]Figures not available. [2]Virginia included with Tennessee. [3]Includes brown-rock matrix of sinter grade and sintered brown rock. [4]Does not include plant stocks of washer-grade matrix.

FALL MEETING OF THE N. F. A.

(Continued from page 8)

"June Grazing in January" was the topic of Mr. Comer's speech—a paraphrase of a statement by Henry Grady, exponent of the New South, that prosperity will only arrive when the South has green fields in winter. "This condition is fast coming into being," declared Mr. Comer. "The Soil Conservation Corps and the various county farm agencies are doing a splendid job in teaching soil usefulness and plant controls.

"This agricultural prosperity," Mr. Comer predicted, "will furnish customers for goods—goods that all of us make. And when that happens, we will prosper. Fertilizer can play a very positive role in bringing this program into being, and also can reap its share of the resulting benefits."

A call for the American farmer to put his pastures and fields to better use was made by R. H. Lush, Pasture Specialist, The National Fertilizer Association.

"If livestock are to be most profitably maintained," declared Mr. Lush, "pastures and fields must provide more days of grazing throughout the year by means of better pasture management. This involves a sufficient supply of plant food and of suitable liming materials for desirable pasture plants to make enough growth to cover and protect the soil and to provide forage; and regulation of the number of livestock and periods of grazing to give uniform production . . .

"Each passing year of research has piled up more evidence that no grass or legume, no matter how definitely it is adapted to the land on which it grows, can long continue to be produced with maximum of profit unless the fertility of the soil is maintained at a high level. Hundreds of experiments and thousands of demonstrations in pasture improvement reaching into every State have confirmed this. It is no longer a question of whether to fertilize but rather when and how."

The details of the Convention were ably handled by the local committee consisting of J. Walter Cooper, Chairman; D. W. Brooks; George W. McCarty; J. Rucker McCarty; A. H. Sterne. Arrangements had been made at the Capital City Country Club to provide for the fertilizer golfing enthusiasts and a number took advantage of the opportunity to play over this nationally famous course.

A Fertilizer Trend to Higher Analyses

There is a change in the cropping pattern in North Carolina and a definite trend in recent years to fertilizers of higher analysis.

The cotton acreage in the state has dropped from 1,665,000 acres in 1939 to 587,000 acres this year. Corn, which occupies approximately one-third of the crop acreage, is receiving more fertilizer and this, together with hybrid seed, may be the means of doubling yields during the next few years. More corn per acre means fewer acres in corn or more livestock.

Pasture fertilization, which has been neglected for so long, is now receiving special attention and every indication points to considerably more fertilizer being used on pastures in the future. Lime and phosphate form the backbone of the pasture program but potash will become increasingly important as lime and phosphate needs are met, say Dr. Ralph Cummings, head of the Department of Agronomy at State College, and Dr. Emerson Collins, Extension Agronomist.

They point out that, along with the shifts in the cropping pattern, the trend to fertilizers of higher analysis means that the farmer is obtaining his needed plant food at a cheaper cost per unit. They explain that approximately the same overhead, freight, bag costs, and manufacturing expense apply to a ton of low-grade fertilizer as a ton of higher grade.—*North Carolina Agricultural Extension Service.*

See Page 4

September Sulphate of Ammonia

Production of by-product sulphate of ammonia showed a decrease of one per cent from the August figures, according to the statistics of the U. S. Bureau of Mines. This drop in output is much smaller than had been expected as reports from the field during September indicated a production amounting to about 80 per cent of normal. Sales during September continued to increase, with the result that producers had only 26,402 tons on hand at the end of the month, compared with 77,341 tons on hand on September 30, 1944.

	Sulphate of Ammonia Tons	Ammonia Liquor Tons NH_3
Production		
September, 1945	62,642	2,267
August, 1945	63,259	2,251
September, 1945	65,765	2,632
January–September, 1945	590,795	21,077
January–September, 1944	611,707	23,859
Sales		
September, 1945	64,896	1,902
August, 1945	61,639	2,095
September, 1944	67,641	2,468
January–September, 1945	633,771	19,529
January–September, 1944	561,322	22,856
Stocks on Hand		
September 30, 1945	26,402	1,028
August 31, 1945	29,072	810
September 30, 1944	77,341	637

North Carolina Fertilizer Consumption Breaks Records

According to figures compiled by D. S. Coltrane, Asst. Commissioner of Agriculture, North Carolina farmers used during the fiscal year 1944–45, 1,163,563 tons of mixed fertilizer compared with 1,152,863 tons during the fiscal year 1943–44, and compared with 1,055,689 tons during 1942–43.

Total sales including materials based on manufacturers' tonnage reports amounted to 1,399,198 tons. The tonnage based on tax tag sales amounted to 1,466,277 tons compared with 1,393,689 tons during the previous year, showing an increase of 7 per cent.

Total sales of liming materials and landplaster including that distributed by the Agricultural Adjustment Agency amounted to 512,032 tons.

There was used in mixed fertilizers a total of 42,210 tons of nitrogen, in fertilizer materials a total of 23,129 tons of nitrogen. Total nitrogen consumption for the fiscal year was 65,339 tons, which is the equivalent of 408,369 tons of nitrate of soda.

There was used in mixed fertilizers a total of 107,367 tons of phosphoric acid, in fertilizer materials a total of 5,754 tons. Total phosphoric acid consumption for the fiscal year was 113,112 tons, which is the equivalent of 622,116 tons of 18 per cent superphosphate.

There was used in mixed fertilizers a total of 72,072 tons of potash, in fertilizer materials a total of 5,492 tons. Total potash consumption for the fiscal year was 77,564 tons, which is the equivalent of 155,128 tons of 50 per cent muriate of potash.

The data on usage show that 70 per cent of the mixed fertilizers contained 18 or more units of plant food compared with 71 per cent the previous year, 67.5 per cent in 1942–43, and 37 per cent in 1941–42.

The data also show that 47 per cent of the tonnage contained 20 or more units of plant food compared with 28 per cent the previous year and 17 per cent in 1942–43.

The data show that 83 per cent of last year's fertilizer was of grades recommended by the Experiment Station, which is the same percentage as that for the previous year. In 1938 only 42 per cent was of grades

recommended by the Experiment Station.

The mixed fertilizers averaged 3.5 units of nitrogen, 9.2 units of phosphoric acid, and 6.1 units of potash. Therefore, the mixed fertilizers sold averaged 18.8 units of plant food.

It is evident that farmers are more intelligently purchasing higher analysis and recommended grades of fertilizer. The average plant food content should be increased from 18.8 to 20 units or more. This goal should be reached within the next two or three years.

The increase in the use of higher analysis fertilizers is, of course, due in large part to the wartime restriction on grades. The Board of Agriculture, however, deserves great credit for the campaign of education which has been conducted during the past several years to reduce the number of grades and increase their plant food content. In this they have been aided by the State Legislature which has steadily reduced the limits on the number of grades to be recommended in the State. In 1941, a minimum of 35 and a maximum of 50 grades were established; by 1945, this had been reduced to a minimum of 15 and a maximum of 25. There are now 22 grades on the recommended list.

Leaf Analysis an Aid to Fertilizer Recommendations

Fruit trees obtain from the soil upon which they grow the mineral elements necessary for their proper nutrition. Since soil is so variable, even within small areas, a representative sample is very difficult to obtain. For this reason, increasing emphasis is being placed on permitting the tree to sample the soil and than analyzing some part of the tree to determine its nutritional status, states I. W. Wander of the Department of Horticulture at the Ohio Agricultural Experiment Station.

It is a well-established fact that the leaves of a plant are the chemical factories of that plant. It is in the leaves that the energy of sunlight results in the synthesis of food materials for the plant and, ultimately, for man. Certain minerals are necessary for this synthesis. Therefore, the leaf, being the manufacturing organ of the plant, is usually the best place to obtain a sample for analysis to indicate the mineral nutrition of the plant as a whole.

Controlled experiments in the greenhouse where young trees are furnished definite amounts and combinations of nitrogen, phosphorus, potassium, calcium, and magnesium show that the concentrations of these nutrient elements are reflected in the chemical analysis of their leaves. Such experiments, coupled with the analysis of leaves taken from trees under long-time fertilizer experiments, indicate limits of nutrition which will impair production and quality of produce.

After reliable critical limits for the various mineral nutrients have been established for a fruit crop, and even varieties of the same crop differ, leaf analysis can be used for a basis of fertilizer and cultural recommendations. Leaf analysis will furnish the grower a valuable diagnostic aid in solving nutritional disorders and in making more economical and effective fertilizer applications.

This type of work is still in the experimental stage—that is, the critical limits for the various mineral nutrients have not been definitely established for different fruit crops.

Manure from Herd Not Enough to Replace Fertility

It used to be said, "If you want to build up the fertility of your farm, keep dairy cows." With certain reservations, this may be true; but no fluid milk producer should ever lose sight of the fact that in every ton

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VICTORY LOAN

of milk sent off the farm there are 14 to 18 pounds of mineral matter, mostly lime or phosphate. Like the steady dripping of water on hard stone, daily shipments of milk from any farm will steadily wear away that farm's fertility.

Do purchased grain concentrates fed to milk cows help replace this mineral loss? To some extent, yes; but how much it helps depends a great deal on how the manure from the herd is handled to prevent loss from leaching.

The fact that every dairy farmer must buy lime and phosphate in order to grow alfalfa, clover, and grass is ample evidence that purchased grain concentrates do not replace the minerals lost in milk production.

Every farmer knows that the fertilizing constituents in manure come entirely from the feed consumed, for animals do not create any fertility value. The animal merely voids a greater or lesser percentage of the nitrogen, phosphorus or potassium—the essential fertilizing elements—that it gets in its feed. Therefore, only mineral-rich feeds make manure that is rich in fertilizing constituents. Dairy cows void only 65 per cent of the nitrogen, 50 per cent of the phosphorus, and 70 per cent of the potassium contained in the ration. Consequently the manure from the herd does not supply enough fertilizer for the average dairy farm needs.—*Virginia Extension Division News.*

Potash Production Increases

The five major American potash producing companies delivered in the United States, Canada, Cuba, Hawaii, and Puerto Rico during the second quarter of 1945, a total of 387,514 tons of potash salts containing an equivalent of 210,226 tons of K_2O, the American Potash Institute has announced. This represents an increase of 20.6 per cent in salts and 20.2 per cent in K_2O over the tonnage delivered during the corresponding period in 1944. Deliveries for agricultural purposes amounted to 348, 991 tons of salts equivalent to 186,219 tons of K_2O, consisting of 160,859 tons as muriate, 11,341 tons as manure salts, and 14,019 tons of sulphate of potash and sulphate of potash-magnesia. Deliveries for chemical use amounted to 38,522 tons of salts with an equivalent of 24,007 tons of K_2O.

For the first six months of 1945 deliveries to United States, Canada, Cuba, Puerto Rico, and Hawaii amounted to 821,521 tons of salts containing an equivalent of 441,446 tons K_2O. These represent an increase of 10.0 per cent in salts and 13.4 per cent in K_2O over the same period in 1944. Deliveries of potash for agricultural use totaled 743,566 tons of salts, with an equivalent of 392,964 tons K_2O, an increase of 9.2 per cent in salts and 12.9 per cent in K_2O. Agricultural deliveries consisted of 337,474 tons of K_2O as muriate, 26,062 tons K_2O as manure salts, and 29,428 tons K_2O as sulphate of potash and sulphate of potash-magnesia. The chemical industries took 77,955 tons of potash salts containing an equivalent of 48,482 tons K_2O, which represents an increase of 17.8 per cent in salts and 17.5 per cent in K_2O over the first half of 1944.

POTASH DELIVERIES
SHORT TONS K_2O
(UNITED STATES, CANADA, CUBA, HAWAII, PUERTO RICO)

	Jan.-June 1945	Jan.-June 1944	April-June 1945	April-June 1944
Muriate	337,474	290,423	160,859	134,393
Manure Salts	26,062	31,842	11,341	8,388
Sulphate and Sul. Pot. Mag.	29,428	25,767	14,019	12,021
Total Agricultural	392,964	348,032	186,219	154,802
Chemical	48,482	41,258	24,007	20,094
Grand Total	441,446	389,290	210,226	174,896

BUYERS' GUIDE • A CLASSIFIED INDEX TO ALL THE ADVERTISERS IN "THE AMERICAN FERTILIZER"

AMMONIA—Anhydrous and Liquor
Barrett Division, The, Allied Chemical & Dye Corp., New York City.
DuPont de Nemours & Co., E. I., Wilmington, Del.
Hydrocarbon Products Co., New York City.
Nitrogen Products, Inc., New York City

AMMONIUM NITRATE SOLUTIONS
Barrett Division, The, Allied Chemical & Dye Corp., New York City.

BAG MANUFACTURERS—Burlap
Bemis Bro. Bag Co., St. Louis, Mo.
Fulton Bag & Cotton Mills, Atlanta, Ga.
Mente & Co., Inc., New Orleans, La.
Virginia-Carolina Chemical Corp., Richmond, Va.

BAG MANUFACTURERS—Cotton
Bemis Bro. Bag Co., St. Louis, Mo.
Fulton Bag & Cotton Mills, Atlanta, Ga.
Mente & Co., Inc., New Orleans, La.
Virginia-Carolina Chemical Corp., Richmond, Va.

BAG MANUFACTURERS—Paper
Bemis Bro. Bag Co., St. Louis, Mo.
Fulton Bag & Cotton Mills, Atlanta, Ga.
Hammond Bag & Paper Co., Welisburg, W. Va.
Jaite Company, The, Jaite, Ohio
Raymond Bag Co., Middletown, Ohio.
St. Regis Paper Co., New York City.

BAGS—Dealers and Brokers
Ashcraft-Wilkinson Co., Atlanta, Ga.
Huber & Company, New York City.
McIver & Son, Alex. M., Charleston, S. C.

BAG CLOSING MACHINES
St. Regis Paper Co., New York City.

BAG PRINUINNG—Machinery
Schmutz Mfg. Co., Louisville, Ky.

BAGGING MACHINES—For Filling Sacks
St. Regis Paper Co., New York City.
Sackett & Sons Co., The A. J., Baltimore, Md.
Utility Works, The, East Point, Ga.

BONE BLACK
American Agricultural Chemical Co., New York City.
Armour Fertilizer Works, Atlanta, Ga.
Huber & Company, New York City.

BONE PRODUCTS
American Agricultural Chemical Co., New York City.
Armour Fertilizer Works, Atlanta, Ga.
Ashcraft-Wilkinson Co., Atlanta, Ga.
Bradley & Baker, New York City.
Huber & Company, New York City.
McIver & Son, Alex. M., Charleston, S. C.
Scar-Lipman & Co., Inc., Irvington, N. J.
Schmaltz, Jos. H., Chicago, Ill.

BORAX AND BORIC ACID
American Potash and Chem. Corp., New York City.

BROKERS
Ashcraft-Wilkinson Co., Atlanta, Ga.
Bradley & Baker, New York City.
Huber & Company, New York City.
Keim, Samuel D., Philadelphia, Pa.
McIver & Son, Alex. M., Charleston, S. C.
Scar-Lipman & Co., Inc., Irvington, N. J.
Schmaltz, Jos. H., Chicago, Ill.

BUCKETS—Elevator
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman's Foundry and Mach. Works, Aurora, Ind.

BUCKETS—For Hoists, Cranes, etc.
Hayward Company, The, New York City.

CARBONATE OF AMMONIA
American Agricultural Chemical Co., New York City
DuPont de Nemours & Co., E. I., Wilmington, Del.

CARS AND CARTS
Hough Co., The Frank G., Libertyville, Ill.
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman's Foundry and Mach. Works, Aurora, Ind.
Utility Works, The, East Point, Ga.

CHEMICALS
American Agricultural Chemical Co., New York City.
Armour Fertilizer Works, Atlanta, Ga.
Ashcraft-Wilkinson Co., Atlanta, Ga.
Barrett Division, The, Allied Chemical & Dye Corp., New York City.
Bradley & Baker, New York City.
DuPont de Nemours & Co., E. I., Wilmington, Del.
Huber & Company, New York City.
International Minerals & Chemical Corporation, Chicago, Ill.
McIver & Son, Alex. M., Charleston, S. C.
Nitrogen Products, Inc., New York City
Scar-Lipman & Co., Inc., Irvington, N. J.
Virginia-Carolina Chemical Corp., Richmond, Va.

CHEMISTS AND ASSAYERS
Gascoyne & Co., Baltimore, Md.
Shuey & Company, Inc., Savannah, Ga.
Stillwell & Gladding, New York City.
Wiley & Company, Baltimore, Md.

CONDITIONERS AND FILLERS
American Limestone Co., Knoxville, Tenn.
Keim, Samuel D., Philadelphia, Pa.

COPPER SULPHATE
Tennessee Corporation, Atlanta, Ga.

COTTONSEED PRODUCTS
Ashcraft-Wilkinson Co., Atlanta, Ga.
Bradley & Baker, New York City.
Huber & Company, New York City.
McIver & Son, Alex. M., Charleston, S. C
Scar-Lipman & Co., Inc., Irvington, N. J
Schmaltz, Jos. H., Chicago, Ill.

CYANAMID
American Agricultural Chemical Co., New York City.
Ashcraft-Wilkinson Co., Atlanta, Ga.
Bradley & Baker, New York City.
Scar-Lipman & Co., Inc., Irvington, N. J.

DRYERS
Sackett & Sons Co., The A. J., Baltimore, Md.

ENGINEERS—Chemical and Industrial
Chemical Construction Corp., New York City.
Sackett & Sons Co., The A. J., Baltimore, Md.
Titlestad, Nicolay, New York City
Stedman's Foundry and Mach. Works, Aurora, Ind.

FERTILIZER MANUFACTURERS
American Agricultural Chemical Co., New York City.
Armour Fertilizer Works, Atlanta, Ga.
International Minerals and Chemical Corporation, Chicago, Ill.
Southern States Phosphate & Fertilizer Co., Savannah, Ga.
U. S. Phosphoric Products Division, Tennessee Corp., Tampa, Fla.
Virginia-Carolina Chemical Corp., Richmond, Va.

FISH SCRAP AND OIL
Ashcraft-Wilkinson Co., Atlanta, Ga.
Bradley & Baker, New York City.
Huber & Company, New York City.
McIver & Son, Alex. M., Charleston, S. C.
Scar-Lipman & Co., Inc., Irvington, N. J.

FOUNDERS AND MACHINISTS
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Stedman's Foundry and Mach. Works, Aurora, Ind.
Utility Works, The, East Point, Ga.

A Classified Index to Advertisers in "The American Fertilizer"

BUYERS' GUIDE

For an Alphabetical List of all the Advertisers, see page 33

HOPPERS
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman's Foundry and Mach. Works, Aurora, Ind.
Utility Works, The, East Point, Ga.

IMPORTERS, EXPORTERS
Armour Fertilizer Works, Atlanta, Ga.
Ashcraft-Wilkinson Co., Atlanta, Ga.
Bradley & Baker, New York City.
Scar-Lipman & Co., Inc., Irvington, N. J.

IRON SULPHATE
Tennessee Corporation, Atlanta, Ga.

INSECTICIDES
American Agricultural Chemical Co., New York City.

LIMESTONE
American Agricultural Chemical Co., New York City.
American Limestone Co., Knoxville, Tenn.
Ashcraft-Wilkinson Co., Atlanta, Ga.
Bradley & Baker, New York City.
McIver & Son, Alex. M., Charleston, S. C.
Scar-Lipman & Co., Inc., Irvington, N. J.

LOADERS—Car and Wagon
Hough Co., The Frank G., Libertyville, Ill.
Sackett & Sons Co., The A. J., Baltimore, Md.

MACHINERY—Acid Making and Handling
Chemical Construction Corp., New York City.
Monarch Mfg. Works, Inc., Philadelphia, Pa.
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman's Foundry and Mach. Works, Aurora, Ind.
Utility Works, The, East Point, Ga.

MACHINERY—Ammoniating
Sackett & Sons Co., The A. J., Baltimore, Md.

MACHINERY—Elevating and Conveying
Hough Co., The Frank G., Libertyville, Ill.
Hayward Company, The, New York City.
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman's Foundry and Mach. Works, Aurora, Ind.
Utility Works, The, East Point, Ga.

MACHINERY—Grinding and Pulverizing
Bradley Pulverizing Co., Allentown, Pa.
Sackett & Sons Co., The A. J., Baltimore, Md.
Sedberry, Inc., J. B., Utica, N. Y., Franklin, Tenn.
Stedman's Foundry and Mach. Works, Aurora, Ind.
Utility Works, The, East Point, Ga.

MACHINERY—Material Handling
Hayward Company, The, New York City.
Hough Co., The Frank G., Libertyville, Ill.
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman's Foundry and Mach. Works, Aurora, Ind.
Utility Works, The, East Point, Ga.

MACHINERY—Mixing, Screening and Bagging
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman's Foundry and Mach. Works, Aurora, Ind.
Utility Works, The, East Point, Ga.

MACHINERY—Power Transmission
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman's Foundry and Mach. Works, Aurora, Ind.

MACHINERY—Superphosphate Manufacturing
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman's Foundry and Mach. Works, Aurora, Ind.
Utility Works, The, East Point, Ga.

MANGANESE SULPHATE
McIver & Son, Alex. M., Charleston, S. C.
Tennessee Corporation, Atlanta, Ga.

MIXERS
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman's Foundry and Mach. Works, Aurora, Ind.
Utility Works, The, East Point, Ga.

NITRATE OF SODA
American Agricultural Chemical Co., New York City.
Armour Fertilizer Works, Atlanta, Ga.
Ashcraft-Wilkinson Co., Atlanta, Ga.
Barrett Division, The, Allied Chemical & Dye Corp., New York City.

NITRATE OF SODA—Continued
Bradley & Baker, New York City.
Huber & Company, New York City.
International Minerals & Chemical Corporation, Chicago, Ill.
McIver & Son, Alex. M., Charleston, S. C.
Scar-Lipman & Co., Inc., Irvington, N. J.
Schmaltz, Jos. H., Chicago, Ill.

NITROGEN SOLUTIONS
Barrett Division, The, Allied Chemical & Dye Corp., New York City.

NITROGENOUS ORGANIC MATERIAL
American Agricultural Chemical Co., New York City.
Armour Fertilizer Works, Atlanta, Ga.
Ashcraft-Wilkinson Co., Atlanta, Ga.
Bradley & Baker, New York City.
DuPont de Nemours & Co., Wilmington, Del.
Huber & Company, New York City.
International Minerals & Chemical Corporation, Chicago, Ill.
McIver & Son, Alex. M., Charleston, S. C.
Scar-Lipman & Co., Inc., Irvington, N. J.

NOZZLES—Spray
Monarch Mfg. Works, Philadelphia, Pa.

PHOSPHATE ROCK
American Agricultural Chemical Co. New York City.
Armour Fertilizer Works, Atlanta, Ga.
Ashcraft-Wilkinson Co., Atlanta, Ga.
Bradley & Baker, New York City.
Huber & Company, New York City.
International Minerals & Chemical Corporation, Chicago, Ill.
McIver & Son, Alex. M., Charleston, S. C.
Ruhm, H. D., Mount Pleasant, Tenn.
Scar-Lipman & Co., Inc., Irvington, N. J.
Schmaltz, Jos. H., Chicago, Ill.
Southern Phosphate Corp., Baltimore, Md.
Virginia-Carolina Chemical Corp., Richmond, Va.

PLANT CONSTRUCTION—Fertilizer and Acid
Chemical Construction Corp., New York City.
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman's Foundry and Mach. Works, Aurora, Ind.
Titlestad, Nicolay, New York City
Utility Works, The, East Point, Ga.

POTASH SALTS—Dealers and Brokers
American Agricultural Chemical Co., New York City.
Armour Fertilizer Works, Atlanta, Ga.
Ashcraft-Wilkinson Co., Atlanta, Ga.
Bradley & Baker, New York City.
Huber & Company, New York City.
International Minerals & Chemical Corporation, Chicago, Ill.
Scar-Lipman & Co., Inc., Irvington, N. J.
Schmaltz, Jos. H., Chicago, Ill.

POTASH SALTS—Manufacturers
American Potash and Chem. Corp., New York City.
Potash Co. of America, New York City.
International Minerals & Chemical Corp., Chicago, Ill.
United States Potash Co., New York City.

PRINTING PRESSES—Bag
Schmutz Mfg. Co., Louisville, Ky.

PYRITES—Brokers
Ashcraft-Wilkinson Co., Atlanta, Ga.

REPAIR PARTS AND CASTINGS
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman's Foundry and Mach. Works, Aurora, Ind.
Utility Works, The, East Point, Ga.

ROUGH AMMONIATES
Bradley & Baker, New York City.
McIver & Son, Alex. M., Charleston, S. C.
Scar-Lipman & Co., Inc., Irvington, N. J.
Schmaltz, Jos. H., Chicago, Ill.

SCALES—Including Automatic Bagging
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman's Foundry and Mach. Works, Aurora, Ind.
Utility Works, The, East Point, Ga.

BUYERS' GUIDE

SCREENS
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman's Foundry and Mach. Works, Aurora, Ind.
Utility Works, The, East Point, Ga.

SEPARATORS—Air
Sackett & Sons Co., The A. J., Baltimore, Md.

SPRAYS—Acid Chambers
Monarch Mfg. Works, Inc., Philadelphia, Pa.

SULPHATE OF AMMONIA
American Agricultural Chemical Co., New York City.
Armour Fertilizer Works, Atlanta, Ga.
Ashcraft-Wilkinson Co., Atlanta, Ga.
Barrett Division, The, Allied Chemical & Dye Corp., New York City.
Bradley & Baker, New York City.
Huber & Company, New York City.
Hydrocarbon Products Co., New York City.
McIver & Son, Alex. M., Charleston, S. C.
Nitrogen Products, Inc., New York City
Scar-Lipman & Co., Inc., Irvington, N. J.
Schmaltz, Jos. H., Chicago, Ill.

SULPHUR
Ashcraft-Wilkinson Co., Atlanta, Ga.
Texas Gulf Sulphur Co., New York City.
Virginia-Carolina Chemicrl Corp., Richmond, Va.

SULPHURIC ACID
American Agricultural Chemical Co., New York City.
Armour Fertilizer Works, Atlanta, Ga.
Ashcraft-Wilkinson Co., Atlanta, Ga.
Bradley & Baker, New York City.
Huber & Company, New York City.
International Minerals & Chemical Corporation, Chicago, Ill.
McIver & Son, Alex. M., Charleston, S. C.
Scar-Lipman & Co., Inc., Irvington, N. J.
U. S. Phosphoric Products Division, Tennessee Corp., Tampa, Fla.

SUPERPHOSPHATE
American Agricultural Chemical Co., New York City.
Armour Fertilizer Works, Atlanta, Ga.
Ashcraft-Wilkinson Co., Atlanta, Ga.
Bradley & Baker, New York City.
Huber & Company, New York City.
International Minerals & Chemical Corporation, Chicago, Ill.
McIver & Son, Alex. M., Charleston, S. C.
Scar-Lipman & Co., Inc., Irvington, N. J.
Schmaltz, Jos. H., Chicago, Ill.
Southern States Phosphate & Fertilizer Co., Savannah, Ga.
U. S. Phosphoric Products Division, Tennessee Corp., Tampa, Fla.
Virginia-Carolina Chemical Corp., Richmond, Va.

SUPERPHOSPHATE—Concentrated
Armour Fertilizer Works, Atlanta, Ga.
International Minerals & Chemical Corporation, Chicago, Ill.
U. S. Phosphoric Products Division, Tennessee Corp., Tampa, Fla.
Virginia-Carolina Chemical Corp., Richmond, Va.

TANKAGE
American Agricultural Chemical Co., New York City.
Armour Fertilizer Works, Atlanta, Ga.
Ashcraft-Wilkinson Co., Atlanta, Ga.
Bradley & Baker, New York City.
International Minerals & Chemical Corporation, Chicago, Ill.
McIver & Son, Alex. M., Charleston, S. C.
Scar-Lipman & Co., Inc., Irvington, N. J.
Schmaltz, Jos. H., Chicago, Ill.

UREA
DuPont de Nemours & Co., E. I., Wilmington, Del.

UREA-AMMONIA LIQUOR
DuPont de Nemours & Co., E. I., Wilmington, Del.

VALVES
Monarch Mfg. Works, Inc., Philadelphia, Pa.
Utility Works, The, East Point, Ga.

ZINC SULPHATE
Tennessee Corporation, Atlanta, Ga.

Alphabetical List of Advertisers

THE FIRST TEN YEARS...

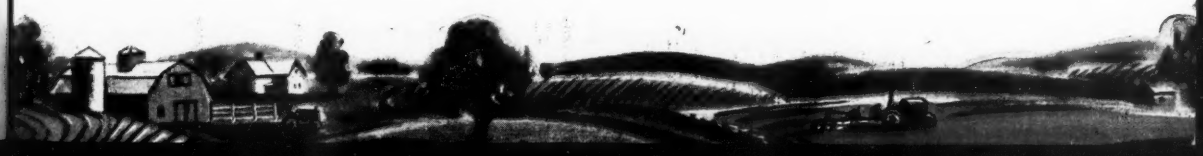
We celebrate this year our tenth anniversary as a producer of high-grade Muriate of Potash. A decade of progress, development, and considerable expansion lies behind us; a decade of great importance lies ahead.

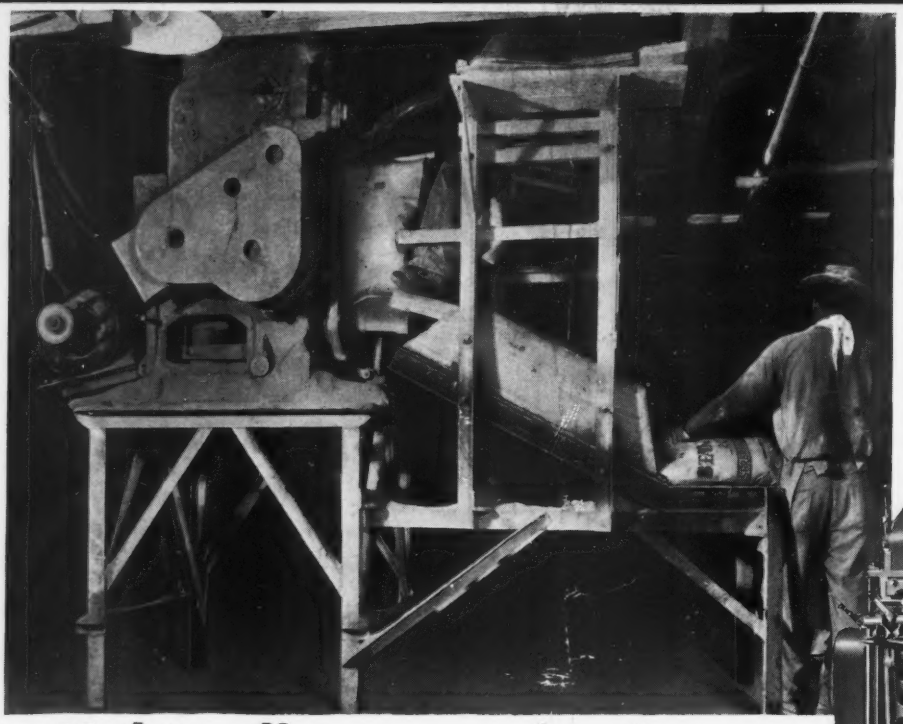
Our accomplishment in the past is due, in great measure, to encouragement, loyalty and confidence of our many friends. We face the future determined to deserve your continuing patronage and good-will through service of a high order to the fertilizer industry and to American agriculture.

POTASH COMPANY of AMERICA

CARLSBAD, NEW MEXICO

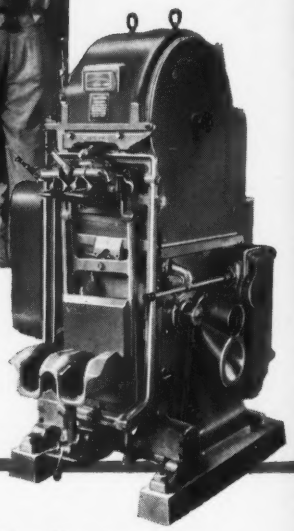
GENERAL SALES OFFICE...50 Broadway, New York, N. Y. • MIDWESTERN SALES OFFICE...612 Lehmann Bldg., Peoria, Ill.
SOUTHERN SALES OFFICE...Mortgage Guarantee Building, Atlanta, Ga.





At left: This machine simultaneously fills and weighs Multiwall Paper Valve Bags.

Below: Showing the sturdy, compact construction which makes for dependability and economy of operation.



Multiwall paper valve bags...

the ideal fertilizer package

YOU can speed up bag filling operations and actually reduce labor costs with St. Regis Multiwall Paper Valve Bags and Bag-filling Equipment.

St. Regis Valve-bag filling machines (shown above) not only quickly fill the bags, but they accurately preweigh your product.

And, when the bag is filled, the internal pressure of the contents automatically closes the bag valve. Naturally, this eliminates the need for any further closing equipment. As soon as the bags are filled, they are all ready for shipping.

Moisture resistant, too

Multiwall bags are custom-built of several plies of specification kraft paper. They provide a tight moisture-resistant package which permits fertilizer to be stored out-of-doors without caking or damage through decomposition.

St. Regis Packaging experts will be pleased to discuss the type of bag and bag-filling system best suited to your particular requirements. Write for full information.

Only Multiwalls offers these
4 BIG ADVANTAGES

1. **PROTECTION.** Tough, moisture-resistant Multiwalls protect your fertilizer in storage or in transit.
2. **ECONOMY.** Multiwalls prevent waste. No siftage losses . . . and the bags empty clean.
3. **EASE OF HANDLING.** Multiwalls are quickly loaded and handled with minimum of labor. Easy to open, too.
4. **CLEANLINESS.** Sturdy, tight Multiwall bags help to keep storerooms neat and clean.

St. Regis MULTIWALL PAPER BAGS

MULTIPLY PROTECTION • MULTIPLY SALEABILITY

ST. REGIS PAPER COMPANY

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NEW YORK 17: 230 Park Ave. CHICAGO 1: 230 No. Michigan Ave.
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Los Angeles New Orleans Franklin, Va. Seattle Nazareth, Pa. Toledo

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